Reviewer's report

Title: Endurance training or beta-blockade can partially block the energy metabolism remodeling taking place in experimental chronic left ventricle volume overload

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Reviewer: Marcus Franz

Reviewer's report:

The study entitled “Endurance training or beta-blockade can partially block the energy metabolism remodeling taking place in experimental chronic left ventricle volume overload” performed by Lachance and co-workers addresses a very interesting topic in the field of cardiac tissue remodelling in response to volume overload caused by aortic valve regurgitation. The authors use an adequate animal model of surgically induced aortic regurgitation and use microPET as the main read out method to assess LV glucose utilization and also analysed the activity of myocardial metabolic key enzymes. The main finding of the study was that exercise or beta-blocker treatment (carvedilol) can influence energy metabolism remodeling in the dilated left ventricle.

The key finding of the study is of great scientific and also clinical interest and could potentially contribute to an improved clinical management of patients suffering from aortic valve regurgitation in case the findings in the animal model are also present in patients.

The idea and motivation of the study is innovative. The experimental protocol concerning the animal model is excellent, the number of animal per group as well as the follow-up time post surgery is adequate.

The introduction is very well focussed and nicely guides the reader to the rationale of the study. Materials and methods are described in detail. The results are presented in a well structured way. The discussion is adequate in length.

There is one major point of concern which should be addressed by the authors before the study, in the eyes of the reviewer, can be considered for publication: A detailed histological analysis of cardiac tissue should necessarily be performed to get an impression about the extent of myocardial tissue damage. This analysis should include alterations of cardiac myocytes as well as parameters of interstitial and vascular remodelling. May be the extent of fibrosis can be assessed morphometrically? Results of histological analysis should be compared between the groups.

In addition, one could perform immunohistochemistry to detect immune cells and thereby get deeper insights into the possible inflammatory response associated with eccentric left ventricular myocardium to volume overload.

These points should be taken into account when preparing a revised version of the manuscript.
Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests.